DETAILED ACTION

Status of Claims

1. Claims 20-27 and 29-44 are current in the application. Claims 20-27 and 29-44 are currently under examination. Claims 1-19 and 28 have been cancelled by Applicant.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 32 is rejected under 35 U.S.C. 112, second paragraph. The current claim reads, "using a change in an electric potential of the voltage or current source as a criterion." It is unclear from the claim exactly what step, if any, the criterion of the change in electric potential is used for or with. Furthermore, the terms "using" and "criterion" render the claim indefinite, as it is unclear as to how the change is "used" and what is involved, as well as it being unclear as to what other criterion would be necessary, how the assessment is made, and upon what factors such decisions are based.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 40 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Goto et al (US Pat. Pub. 2006/0086617 A1).

Regarding claim 40, Goto et al teaches an electrode for electrochemically stripping components comprising: an impression of a component region to be stripped (where the Examiner is construing stripping as an electrical discharge surface-treatment method), the impression being formed from a moldable, electrically conductive compound. (para. 0015, lines 5-7). Therefore, the electrode of Goto et al anticipates the electrode of claim 40.

Regarding claim 43, Goto et al teaches that the electrode is porous, and the moldable, electrically conductive compound is a sintered material. (para. 0042, lines 5-8)

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 20-27, 29, 31-37, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Updegrove et al (US 6,165,345) in view of Tchugunov (US 6,835,299 B1).

9. Regarding claims 20, 29, and 44, Updegrove et al teaches a method for electrochemically stripping components comprising the steps of: connecting a component to be stripped to a positive (or one of a positive or negative) terminal of a voltage or current source and an electrode to a negative (or to the other of the positive and the negative) terminal of the voltage or current source (col. 1, lines 52-55); positioning the electrode so that a gap between a region of the component to be stripped and the electrode is a same size over an entirety of the region to be stripped (where the Examiner is construing the tailoring of the grid as positioning the electrode in relationship to the component in e.g. a three-dimensional contour) (col. 1, lines 55-59), the electrode being adapted to a region of the component to be stripped (col. 1, lines 55-59); and electrochemically stripping the component. (col. 1, line 67 and col. 2, lines 1-2), where the total process cycle is on the order of minutes. (col. 2, lines 2-8)

10. Updegrove et al does not explicitly teach that the current or the voltage applied for the stripping process is time pulsed.

11. Tchugunov teaches time pulsing of the current applied for the stripping process, where the current pulses may have a fixed phase relationship with the mechanical vibration of the electrode and so may have a pulse frequency between e.g. 1-100 Hz. (col. 2, lines 1-5 and col. 1, lines 53-56). Tchugunov teaches that this time pulsing promotes erosion efficiency and minimizes stray erosion. (col. 2, lines 6-15)

12. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Updegrove et al by using a time-pulsed current during the stripping process as taught by Tchugunov, because this would promote erosion efficiency and minimize stray erosion. (see Tchugunov, col. 2, lines 6-15)

13. Regarding claim 21, Updegrove teaches that a surface of the electrode facing the component to be stripped is precisely adapted in an electrode three-dimensional contour to a component three-dimensional contour of a surface of the region to be stripped (where the Examiner is construing the tailoring of the grid as positioning the electrode in relationship to the component in e.g. a three-dimensional contour). (col. 1, lines 55-59)

14. Regarding claim 27, Updegrove teaches that the electrode is a porous electrode (where the Examiner is construing the shaped grid as porous) (col. 1, lines 54-55), and further comprising supplying or replacing an electrolyte through the electrode. (col. 1, lines 43-46)

15. Regarding claim 31, Updegrove et al teaches that process parameters used for the stripping are selected to prevent a passivation of the region to be stripped (where the Examiner is construing the lack of damage to the base metal as a lack of passivation) (col. 2, lines 45-47), so that an entirety of stripping a coating from the region of the component is capable of being implemented in one sequence of operation until complete removal of the coating is achieved. (col. 1, lines 44-48)

16. Regarding claim 33, Updegrove et al teaches that the component may be a gas turbine component. (col. 1, lines 4-6 and col. 3, lines 7-8)

17. Regarding claim 34, Updegrove et al teaches that the stripping is at least part of a step of repairing the gas turbine component. (col. 1, lines 5-6 and col. 2, lines 20-26)

18. Regarding claim 35, Updegrove et al teaches that the gas turbine blades are made of a titanium-based alloy or of a nickel-based alloy (where the Examiner is construing the Rene 80 base metal as a nickel-based alloy) (col. 2, lines 52-55).

19. Regarding claims 36 and 37, Updegrove et al teaches removing a metallic coating from the component (where the Examiner is construing the aluminide coating as a metallic coating), the component being a gas turbine component (specifically a gas turbine blade), the metallic coating to be removed being adapted to a composition of the gas turbine component. (col. 2, lines 29-32)

20. Regarding claims 22, 23, and 24, Updegrove et al teaches a method for electrochemically stripping components comprising the steps of: connecting a component to be stripped to a positive (or one of a positive or negative) terminal of a voltage or current source and an electrode to a negative (or to the other of the positive and the negative) terminal of the voltage or current source (col. 1, lines 52-55); positioning the electrode so that a gap between a region of the component to be stripped and the electrode is a same size over an entirety of the region to be stripped (where the Examiner is construing the tailoring of the grid as positioning the electrode in relationship to the component in e.g. a three-dimensional contour) (col. 1, lines 55-59), the electrode being adapted to a region of the component to be stripped (col. 1, lines 55-59); and electrochemically stripping the component. (col. 1, line 67 and col. 2, lines 1-2).

21. Updegrove et al does not explicitly teach that the gap between the region of the component to be stripped and the electrode is smaller than 2 mm or 1 mm over the entirety of the region to be stripped, or where the gap is between 10 μm and 1 mm, or that the current or the voltage applied for the stripping process is time pulsed.

22. Tchugunov teaches time pulsing of the current applied for the stripping process, where the current pulses may have a fixed phase relationship with the mechanical vibration of the electrode and so may have a pulse frequency between e.g. 1-100 Hz. (col. 2, lines 1-5 and col. 1, lines 53-56). Tchugunov teaches that this time pulsing promotes erosion efficiency and minimizes stray erosion. (col. 2, lines 6-15) Tchugunov also teaches electrochemically machining (i.e. electrolytically removing material from) a component where the gap between the cathode and the anode may be on the order of 0.01 to 0.005 mm

(col. 1, lines 49-52). Tchugunov teaches that this achieves sharper machining definition. (col. 1, lines 48-49).

23. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Updegrove et al by using a smaller gap as taught by Tchugunov, because this would achieve sharper machining definition. (see Tchugunov, col. 1, lines 48-49).

24. Regarding claims 25 and 26, Updegrove et al teaches a method for electrochemically stripping components comprising the steps of: connecting a component to be stripped to a positive (or one of a positive or negative) terminal of a voltage or current source and an electrode to a negative (or to the other of the positive and the negative) terminal of the voltage or current source (col. 1, lines 52-55); positioning the electrode so that a gap between a region of the component to be stripped and the electrode is a same size over an entirety of the region to be stripped (where the Examiner is construing the tailoring of the grid as positioning the electrode in relationship to the component in e.g. a three-dimensional contour) (col. 1, lines 55-59), the electrode being adapted to a region of the component to be stripped (col. 1, lines 55-59); and electrochemically stripping the component. (col. 1, line 67 and col. 2, lines 1-2).

25. Updegrove et al does not explicitly teach that the electrode executes a mechanical vibration, or that the current or the voltage applied for the stripping process is time pulsed.

26. Tchugunov teaches time pulsing of the current applied for the stripping process, where the current pulses may have a fixed phase relationship with the mechanical vibration of the electrode and so may have a pulse frequency between e.g. 1-100 Hz. (col. 2, lines 1-5 and col. 1, lines 53-56). Tchugunov teaches that this time pulsing promotes erosion efficiency and minimizes stray erosion. (col. 2, lines 6-15) also Tchugunov teaches that the electrode executes a mechanical vibration, wherein a frequency of the mechanical vibration may be between 1 Hz to 100 Hz, and an amplitude of the mechanical vibration may be between 0.1 mm and 2 mm (where the Examiner is construing the total spacing as requiring a limit to the amplitude of the mechanical vibration) (col. 1, lines 53-59 and col. 8, lines 12-15). Tchugunov teaches that this allows use of much smaller gaps and therefore produces sharper machining definition. (col. 1, lines 45-49)

27. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Updegrove et al by using an electrode executing a mechanical vibration as taught by Tchugunov, because this would allow use of much smaller gaps and therefore produce sharper machining definition. (see Tchugunov, col. 1, lines 45-49)

28. Regarding claim 32, Updegrove et al teaches a method for electrochemically stripping components as discussed above.

29. Updegrove et al does not explicitly teach stopping or de- energizing the stripping as a function of a change in an electric potential, or that the current or the voltage applied for the stripping process is time pulsed.

30. Tchugunov teaches time pulsing of the current applied for the stripping process, where the current pulses may have a fixed phase relationship with the mechanical vibration of the electrode and so may have a pulse frequency between e.g. 1-100 Hz. (col. 2, lines 1-5 and col. 1, lines 53-56). Tchugunov teaches that this time pulsing promotes erosion efficiency and minimizes stray erosion. (col. 2, lines 6-15) Tchugunov also teaches stopping or de- energizing the stripping as a function of a change in an electric potential (where the Examiner is construing the control of the machining rate as stopping or de-energizing the stripping). (col. 3, lines 12-17).

31. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Updegrove et al (US 6,165,345) in view of Tchugunov (US 6,835,299 B1) as applied to claim 20 above, and further in view of Jaworowski et al (US 6,176,999 B1).

32. Regarding claim 30, Updegrove et al teaches a method for electrochemically stripping components as discussed above, where the total process cycle is on the order of minutes. (col. 2, lines 2-8)

33. Updegrove et al does not explicitly teach that the current or the voltage applied for the stripping process is time pulsed.

34. Tchugunov teaches time pulsing of the current applied for the stripping process, where the current pulses may have a fixed phase relationship with the mechanical vibration of the electrode and so

may have a pulse frequency between e.g. 1-100 Hz. (col. 2, lines 1-5 and col. 1, lines 53-56). Tchugunov teaches that this time pulsing promotes erosion efficiency and minimizes stray erosion. (col. 2, lines 6-15)

35. Neither Updegrove et al nor Tchugunov explicitly teaches that the average amperage applied for the stripping process is between 0.1 A/mm^2 and 1.5 A/mm^2.

36. Jaworowski et al teaches that the average amperage applied for the stripping process may be in the range of e.g. 50 A/cm^2 (i.e. 0.5 A/ mm^2) (col. 5, lines 67 and col. 6, lines 1-2). Jaworowski et al teaches that an optimum point of greatest stripping selectivity may be found from measuring the current density of coated and stripped airfoils. (col. 3, lines 1-3)

37. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Updegrove and Tchugunov by applying an average amperage between 0.1 A/mm^2 and 1.5 A/mm^2 as taught by Jaworowski et al, because this could be at an optimum point of greatest stripping selectivity found from measuring the current density of coated and stripped airfoils. (see Jaworowski et al, col. 3, lines 1-3)

38. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Updegrove et al (US 6,165,345) and Tchugunov as applied to claim 20 above, and further in view of Kariya et al (US 6,531,049 B1).

39. Regarding claims 38 and 39, Updegrove et al teaches a method for electrochemically stripping components comprising the steps of: connecting a component to be stripped to a positive (or one of a positive or negative) terminal of a voltage or current source and an electrode to a negative (or to the other of the positive and the negative) terminal of the voltage or current source (col. 1, lines 52-55); positioning the electrode so that a gap between a region of the component to be stripped and the electrode is a same size over an entirety of the region to be stripped (where the Examiner is construing the tailoring of the grid as positioning the electrode in relationship to the component in e.g. a three-dimensional contour) (col. 1, lines 55-59), the electrode being adapted to a region of the component to be stripped (col. 1, lines 55-59); and electrochemically stripping the component. (col. 1, line 67 and col. 2, lines 1-2), the component being made of e.g. a nickel-based alloy. (col. 2, lines 52-53)

40. Tchugunov teaches time pulsing of the current applied for the stripping process, where the current pulses may have a fixed phase relationship with the mechanical vibration of the electrode and so may have a pulse frequency between e.g. 1-100 Hz. (col. 2, lines 1-5 and col. 1, lines 53-56). Tchugunov teaches that this time pulsing promotes erosion efficiency and minimizes stray erosion. (col. 2, lines 6-15)

41. Neither Updegrove et al nor Tchugunov explicitly teaches removing a coating of titanium nitride (TIN) or of titanium aluminum nitride (TiAlN) or of titanium zirconium nitride (TiZrN) or of chromium aluminum nitride (CrA1N) or chromium nitride (CrN) from the component.

42. Kariya et al teaches electrochemically removing a TiAlN film from a component (where the Examiner is construing the component as inclusive of titanium-based or nickel-based alloys). (col. 3, lines 52-56). Kariya et al teaches that this allows readjustment, recoating, and recycling of the component. (col. 1, lines 15-26).

43. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Updegrove et al and Tchugunov by removing the TiAlN coating as taught by Kariya et al, because this would allow readjustment, recoating, and recycling of the component. (see Kariya et al, col. 1, lines 15-26).

44. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al (US Pat. Pub. 2006/0086617 A1) in view of Ogawa et al (US 6,596,200 B1).

45. Regarding claim 41, Goto et al teaches an electrode for electrochemically stripping components comprising: an impression of a component region to be stripped (where the Examiner is construing stripping as an electrical discharge surface-treatment method), the impression being formed from a moldable, electrically conductive compound. (para. 0015, lines 5-7).

46. Goto et al does not explicitly teach that the compound is a cured compound.

47. Ogawa et al teaches a moldable, electrically conductive compound. (col. 5, lines 60-67). Ogawa et al teaches that this compound may be used to manufacture a cover (where the Examiner is construing the cover as the electrode) having sufficient surface flexibility to cover a casing (where the Examiner is construing the casing as the component) having a complicated surface configuration. (col. 4, lines 53-64).

48. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the electrode of Goto et al by using the moldable, electrically conductive compound of Ogawa et al, because this would allow manufacture of an electrode having sufficient surface flexibility to cover a component having a complicated surface configuration. (see Ogawa et al, col. 4, lines 53-64).

49. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al (US Pat. Pub. 2006/0086617 A1) in view of Updegrove et al (US 6,165,345).

50. Regarding claim 42, Goto et al teaches an electrode for electrochemically stripping components comprising: an impression of a component region to be stripped (where the Examiner is construing stripping as an electrical discharge surface-treatment method), the impression being formed from a moldable, electrically conductive compound. (para. 0015, lines 5-7).

51. Goto et al does not explicitly teach that the impression is based on a gas turbine component.

52. Updegrove et al teaches that a surface of the electrode facing the component to be stripped is precisely adapted in an electrode three-dimensional contour to a component three-dimensional contour of a surface of the region to be stripped (where the Examiner is construing the tailoring of the grid as positioning the electrode in relationship to the component in e.g. a three-dimensional contour). (col. 1, lines 55-59) Updegrove teaches that this allows uniform coating removal or variation of the removal of the coating along the length of the blade. (col. 2, lines 23-25)

53. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the electrode of Goto et al by basing the impression on a gas turbine component as taught by Updegrove et al, because this would allow uniform coating removal or variation of the removal of the coating along the length of the blade. (see Updegrove, col. 2, lines 23-25).

Response to Arguments

54. The objections to the specification are withdrawn.

55. The rejection of claim 25 under 35 USC 101 is moot in view of the current amendment.

56. Applicant's arguments with respect to claims 20, 21, 27, 31, and 33-37 have been considered but are moot in view of the new ground(s) of rejection.

57. Applicant's arguments filed June 13, 2011 regarding the 35 USC 103 rejections over Updegrove in view of Tchugunov have been fully considered but they are not persuasive. In response to applicant's argument that Updegrove does not need or require increased erosion efficiency, the strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that <u>some</u> advantage or expected beneficial result would have been produced by their combination. MPEP 2144(II). See also *Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick*, 464 F.3d 1356, 1368, 80 USPQ2d 1641, 1651 (Fed. Cir. 2006) ("Indeed, we have repeatedly held that an implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the improvement' is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient. Because the desire to enhance commercial opportunities by improving a product or process is universal—and even common-sensical—we have held that there exists in these situations a motivation to combine prior art references even absent any hint of suggestion in the references themselves." The mere allegation that Applicant finds it <u>unnecessary</u> to improve the process and increase erosion efficiency does not imply that any person of ordinary skill in the art would <u>not</u> find it necessary or desirable to improve the process and increase erosion efficiency.

58. Applicant also argues that the problems of Tchugunov are not found in Updegrove. However, the Examiner is applying Tchugunov to modify the teachings of Updegrove, not vice versa. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, the vibratory motion applied to the electrode of Tchugunov may in fact be a discontinuous vibration, and may be locked to the variation of the electric current. (col. 2, lines 38-47)

59. Applicant's arguments filed June 13, 2011 regarding the 102 and 103 rejections over Goto have been fully considered but they are not persuasive. In response to applicant's argument that Goto does not form an impression of a component region to be stripped, a recitation of the intended use of the claimed

invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The prior art structure is a molded electrode component, and therefore meets the claim.

Conclusion

60. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 3,533,928 (Method of and apparatus for the deburring of workpieces).

61. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLLEEN M. RAPHAEL whose telephone number is (571)270-5991. The examiner can normally be reached from 9:30 a.m. to 6:00 p.m. Mon.-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached at (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. R./
Examiner, Art Unit 1724
August 17, 2011

/Keith D. Hendricks/
Supervisory Patent Examiner, Art Unit 1724